

1. A ruled line extracting apparatus,
comprising:

2. The ruled line extracting apparatus according to claim 1, wherein said estimating means estimates a size of a character pattern included in the input image as the size of the standard pattern.

4. The ruled line extracting apparatus according
25 to claim 1, wherein said straight line extracting

means includes:

straight line deleting means for determining whether or not to delete one of the one or more straight line patterns, by using the threshold value and at least either of information about a shape of one among one or more straight line patterns, and information about a distance between two straight line patterns included in one or more straight line patterns.

5. The ruled line extracting apparatus according to claim 1, wherein said straight line extracting means includes:

straight line deleting means for determining whether or not to delete either of a horizontal straight line pattern and a vertical straight line pattern included in the one or more straight line patterns, based on a link relationship between the horizontal straight line pattern and the vertical straight line pattern and the threshold value.

6. The ruled line extracting apparatus according to claim 1, wherein said straight line extracting means includes:

straight line deleting means for determining

whether or not to delete a shorter pattern of two straight line patterns which are included in the one or more straight line patterns and almost overlap, using the threshold value.

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7. A ruled line extracting apparatus, comprising:

straight line extracting means for extracting information of one or more straight line patterns from an input image;

calculating means for obtaining a representative value of sizes of the one or more straight line patterns;

and

straight line processing means for setting a threshold value based on the representative value, and processing the information of the one or more straight line patterns using the threshold value.

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8. The ruled line extracting apparatus according to claim 7, wherein said calculating means obtains the representative value according to either of a histogram of heights of horizontal straight line patterns included in the one or more straight line patterns, and a histogram of widths of vertical

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straight line patterns included in the one or more straight line patterns.

9. The ruled line extracting apparatus according to claim 7, wherein said straight line processing means further comprises a straight line integrating means for recognizing a straight line pattern after integration as a ruled line candidate, if a size of the straight line pattern generated by integrating two straight line patterns which partially overlap among the one or more straight line patterns, is approximately the representative value.

10. A ruled line extracting apparatus, comprising:
straight line extracting means for extracting information of one or more straight line patterns from an input image;

calculating means for obtaining a representative value of sizes of one or more segment patterns structuring the one or more straight line patterns; and

straight line processing means for setting a threshold value based on the representative value, and processing the information of the one or more straight

line patterns using the threshold value.

11. The ruled line extracting apparatus according to claim 10, wherein said calculating means obtains the representative value according to either of a histogram of heights of horizontal segment patterns included in the one or more segment patterns, and a histogram of widths of vertical segment patterns included in the one or more straight line patterns.

12. The ruled line extracting apparatus according to claim 10, wherein said straight line processing means further comprises:

straight line deleting means for deleting a straight line pattern composed of segment patterns which are larger than the threshold value among the one or more straight line patterns.

13. A ruled line extracting apparatus, comprising:

segment extracting means for extracting information of one or more segment patterns from an input image;

storing means for classifying the information of the one or more segment patterns into information of

whether or not to delete one among the one or more
straight line patterns by using at least one of
information about a shape of the one among the one or
more straight line patterns, and information about a
5 distance between two straight line patterns included
in the one or more straight line patterns.

16. A ruled line extracting apparatus,
comprising:

10 straight line extracting means for extracting
information of one or more straight line patterns from
an input image; and

straight line deleting means for determining
whether or not to delete either of a horizontal
15 straight line pattern and a vertical straight line
pattern included in the one or more straight line
patterns, based on a link relationship between the
horizontal straight line pattern and the vertical
straight line pattern.

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17. A ruled line extracting apparatus,
comprising:

straight line extracting means for extracting
information of one or more straight line patterns from
25 an input image; and

straight line deleting means for deleting a shorter pattern of two straight line patterns which are included in the one or more straight line patterns and almost overlap.

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18. A ruled line extracting apparatus, comprising:

straight line extracting means for extracting information of one or more straight line patterns from an input image; and

straight line integrating means for recognizing a straight line pattern after integration as a ruled line candidate, if a size of the straight line pattern generated by integrating two straight line patterns which partially overlap among the one or more straight line patterns, is approximately a predetermined value.

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19. A ruled line extracting apparatus, comprising:

straight line extracting means for extracting information of one or more straight line patterns from an input image; and

straight line deleting means for deleting a straight line pattern composed of segment patterns which are larger than a threshold value, among the one

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or more straight line patterns.

20. A ruled line extracting apparatus,
comprising:

5 straight line extracting means for extracting
information of a straight line pattern from an input
image;

graph generating means for obtaining the number of
pixels included in a segment pattern of a standard
10 size among one or more segment patterns structuring
the straight line pattern, and generating a graph
representing the number of pixels around the straight
line pattern; and

straight line deleting means for determining
15 whether or not to delete the straight line pattern
based on a shape of the graph.

21. The ruled line extracting apparatus according
to claim 20, further comprising:

20 storing means for attaching a mark to information
of a large segment pattern among the one or more
segment patterns, and storing information of the one
or more segment patterns, wherein said graph
generating means recognizes a segment pattern to which
25 the mark is not attached among the one or more segment

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5 said graph generating means shifts the segment
pattern of the standard size in a direction
perpendicular to a direction of a length of the
straight line pattern, and generates the graph
representing a relationship between an amount of shift
10 and the number of pixels; and

15 23. A computer-readable storage medium, when used
by a computer, to direct the computer to perform the
functions of:

20 setting a threshold value based on information of
the size of the standard pattern; and

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24. A computer-readable storage medium, when used by a computer, to direct the computer to perform the functions of:

5 extracting information of one or more straight line patterns from an input image;

obtaining a representative value of sizes of the one or more straight line patterns;

setting a threshold value based on the representative value; and

10 processing the information of the one or more straight line patterns using the threshold value.

25. A computer-readable storage medium, when used by a computer, to direct the computer to perform the functions of:

15 extracting information of one or more straight line patterns from an input image;

obtaining a representative value of sizes of one or more segment patterns structuring the one or more straight line patterns;

20 setting a threshold value based on the representative value; and

processing the information of the one or more straight line patterns using the threshold value.

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26. A computer-readable storage medium, when used by a computer, to direct the computer to perform the functions of:

5 extracting information of one or more segment patterns from an input image;

classifying the information of the one or more segment patterns into information of a large segment pattern and information of a small segment pattern; and

10 examining a link state of one or more segment patterns, and when a large segment pattern is linked to small segment patterns, extracting a straight line pattern composed of the small segment patterns regardless of a size of the large segment pattern.

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27. A computer-readable storage medium, when used by a computer, to direct the computer to perform the functions of:

20 extracting information of one or more straight line patterns from an input image; and

integrating two straight line patterns included in the one or more straight line patterns into one, if the two straight line patterns almost overlap.

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28. A computer-readable storage medium, when used

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by a computer, to direct the computer to perform the functions of:

extracting information of one or more straight line patterns from an input image; and

5 determining whether or not to delete one among the one or more straight line patterns, using at least either of information about a shape of the one among the one or more straight line patterns, and information about a distance between two straight line
10 patterns included in the one or more straight line patterns.

29. A computer-readable storage medium, when used by a computer, to direct the computer to perform the
15 functions of:

extracting information of one or more straight line patterns from an input image; and

determining whether or not to delete either of a horizontal straight line pattern and a vertical
20 straight line pattern included in the one or more straight line patterns, based on a link relationship between the horizontal straight line pattern and the vertical straight line pattern.

25 30. A computer-readable storage medium, when used

extracting information of one or more straight
line patterns from an input image; and

31. A computer-readable storage medium, when used by a computer, to direct the computer to perform the functions of:

15 recognizing a straight line pattern after
integration as a ruled line candidate, if a size of
the straight line pattern generated by integrating two
straight line patterns which partially overlap among
the one or more straight line patterns is
approximately a predetermined value.

32. A computer-readable storage medium, when used by a computer, to direct the computer to perform the functions of:

extracting information of one or more straight
25 line patterns from an input image; and

33. A computer-readable storage medium, when used by a computer, to direct the computer to perform the functions of:

10 obtaining the number of pixels included in a segment pattern of a standard size among one or more segment patterns structuring the straight line pattern, and generating a graph representing the number of pixels around the straight line pattern; and

34. A ruled line extracting method, comprising the steps of:

setting a threshold value based on information of
the size of the standard pattern; and

extracting information of one or more straight
25 line patterns from the input image, using the

35. A ruled line extracting method, comprising the steps of:

obtaining a representative value of sizes of the
one or more straight line patterns;

setting a threshold value based on the
representative value; and

36. A ruled line extracting method, comprising the steps of:

extracting information of one or more straight
line patterns from an input image;

obtaining a representative value of sizes of one or more segment patterns structuring the one or more straight line patterns;

processing the information of the one or more
straight line patterns using the threshold value.

straight line patterns using the threshold value.

37. A ruled line extracting method, comprising the steps of:

extracting information of one or more segment patterns from an input image;

5 classifying the information of the one or more segment patterns into information of a large segment pattern and information of a small segment pattern; and

10 examining a link state of one or more segment patterns, and when a large segment pattern is linked to small segment patterns, extracting a straight line pattern composed of the small segment patterns regardless of a size of the large segment pattern.

15 38. A ruled line extracting method, comprising the steps of:

extracting information of one or more straight line patterns from an input image; and

20 integrating two straight line patterns included in the one or more straight line patterns, if the two straight line patterns almost overlap.

39. A ruled line extracting method, comprising the steps of:

25 extracting information of one or more straight

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determining whether or not to delete one among the one or more straight line patterns, using at least either of information about a shape of the one among the one or more straight line patterns, and information about a distance between two straight line patterns included in the one or more straight line patterns.

extracting information of one or more straight
line patterns from an input image; and

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extracting information of one or more straight
line patterns from an input image;

25 deleting a shorter pattern of two straight line

patterns which are included in the one or more straight line patterns and almost overlap.

42. A ruled line extracting method, comprising
5 the steps of:

extracting information of one or more straight line patterns from an input image;

recognizing a straight line pattern after
integration as a ruled line candidate, if a size of
10 the straight line pattern generated by integrating two
straight line patterns which partially overlap among
the one or more straight line patterns, is
approximately a predetermined value.

43. A ruled line extracting method, comprising
15 the steps of:

extracting information of one or more straight line patterns from an input image; and

deleting a straight line pattern composed of
20 segment patterns which are larger than a threshold
value, among the one or more straight line patterns.

44. A ruled line extracting method, comprising
the steps of:

25 extracting information of a straight line pattern

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obtaining the number of pixels included in a segment pattern of a standard size among one or more segment patterns structuring the straight line pattern, and generating a graph representing the number of pixels around the straight line pattern; and

determining whether or not to delete the straight line pattern based on a shape of the graph.